

## Responses to: "Patriot Fratricides—The Human Dimension Lessons of Operation Iraqi Freedom"

### Today We Can Automate Complex Procedures

From a networked fires perspective, the author Dr. John K. Hawley [of the article in this edition] brings up a point we must address. Where and how much human intervention is required in any fires chain, regardless of whose it is?

In the case of the Patriot fires chain, the author has taken the position that additional human intervention is required because it is too difficult to automate complex procedures. I disagree with this analysis on the basis that I don't think it is too hard to automate complex procedures.

The author has an accurate assessment that artificial intelligence (AI) is still an undeveloped concept. However, great strides have been made in cognitive reasoning. This is basically complex algorithms programmed into a system to allow it to make decisions based on inputs. We can automate the process with cognitive reasoning. Yes, automating complex procedures is hard, but doable.

The key point in the article is that the current man-machine interfaces have to be improved. The decision really is about speed of service. The better the automated system, the faster we can accomplish the mission. This is not the only consideration, but it is the main one.

We also have to consider fratricide, clearance procedures, ROE [rules of engagement], collateral damage, etc. Future automated systems will be successful if they can prove to be trustworthy and are accepted by commanders.

As the TRADOC [Training and Doctrine Command] Systems Manager for FATDS [FA tactical data systems], I work on automating complex procedures and determining if, when and where the system needs a human IP [intervention point]. I can foresee in the not too distant future the capabilities to design a safe, efficient and fast (collectively also very effective) NetFires system of systems.

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### Automated C<sup>2</sup> Has Fratricide Implications for the FCS Force

I agree with Dr. Hawley's premise that, "Soldiers and not the automated system must be the ultimate decision makers in air and missile defense engagements." I think his assessment also applies to NetFires [networked fires].

But we (the Field Artillery) already know this—have known it for some time. We have an artillery C<sup>2</sup> [command and control] system—AFATDS [advanced FA tactical data system]—that will allow automated (no-man-in-the-loop) fire support, control and direction from sensor-to-shooter.



In our pre-NetFires environment, once a fire mission gets to the shooter (howitzer or launcher), it is fired; our crews are not charged with decision making. (It's different for Patriot sections because our crews don't operate independently as a Patriot section does.) Yet, with this capability, we have purposely built in IPs that allow human decision making to provide oversight to the automated process.

Dr. Hawley rightly asserts that, "Driven by advances in technology and mission changes, Patriot crewmember roles have evolved from traditional operators to supervisors of automated processes. The job of supervisory controller is different from that of traditional operator, and these differences must be reflected in system design, performance support features (decision aids), and training and professional development."

I believe we already are validating Dr. Hawley's assertion through our work in current and future systems designs, decision and performance support aids, and training and professional development. We realize we have moved beyond "operators" to "supervisory controllers." I always have thought that we have to stop thinking of AFATDS and our other ABCS [Army battle command system] pieces as something run by an "operator."

AFATDS is a command and control system and should be controlled by a leader who uses it to assess the situation, make decisions and direct actions. Yet in the past, we routinely put a very junior operator on the system who could set the machine up and run it well but couldn't leverage the C<sup>2</sup> and decision support capacities of the system. This is changing as units realize there is too much lost by taking leaders out of the loop in the process—units are now asking for more experienced Soldiers slotted against the battle command systems.

In the modular force, substitute FEC [fires and effects cell] and AFATDS FDC [fire direction center] for the Patriot crewmember in the article and we have the same responsibilities for Field Artillery Soldiers. In the NetFires world, substitute FEC (and possibly the entire battlefield command network) and we get the feel for the "supervisory controller" aspect that he describes.

Our Soldiers and leaders, who are so integral to the evolving NetFires systems, must be empowered with the ability (training and system design) to use these systems as leadership enablers, not leadership substitutes. There are not many degrees of separation between a good decision to fire a mission and a bad decision to fire a mission—and if a bad decision is made, the excuse cannot be, "The network made me do it."

Much of the talk about "the network" and all of its mysterious technological workings gives me pause to think about some analysis of the early going in WW II provided by Major Ferdinand Miksche in 1941. Major Miksche was a Czech artillery officer who was directed to gather and publish lessons learned from the early fighting in World War II—sort of an early CALL

[Center for Army Lessons Learned] mission.

In contrasting the German and French artillery, he wrote, “The German artillery officer is permeated by the spirit of the infantry. He is capable of appreciating the needs of the infantry and using his own initiative to provide support when and where it is most urgently needed.

“The French gunner officer—once so dashing and audacious—has now become a geometrician and over-theoretical mathematician. He devotes his attention far more to the technical aspects of planning artillery than to the tactical needs of the infantry, of which he has little understanding” (F.O. Miksche,

“Attack—A Study of Blitzkrieg Tactics,” 1941).

We must caution ourselves against becoming enthralled with the “technical aspects” of NetFires and ensure leaders can exercise the “art” of war, using their “initiative to provide support when and where it is most urgently needed.”

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## Response to: “Is It Time for the ADA and FA to Merge?”

The article by our Assistant Commandant (AC), Colonel (Promotable) Mark McDonald, in this edition is certainly most interesting and thought-provoking—and may well indeed foretell the future. But I believe there is a fallacy underlying the potential Army-wide theme of consolidating branches.

The assumption made in this consolidation process is that, institutionally, we can train and educate officers to become proficient and multi-faceted in fairly technical and complex skill sets. These skill sets are those in the Field Artillery, Air Defense Artillery and effects coordination/integration.

However, institutional training and education are only a part and, although vitally important, a small part of the development process. Service in the operating forces, learning and honing those skills within each separate but vital MOS [military occupational specialty], is what separates the professional from the amateur.

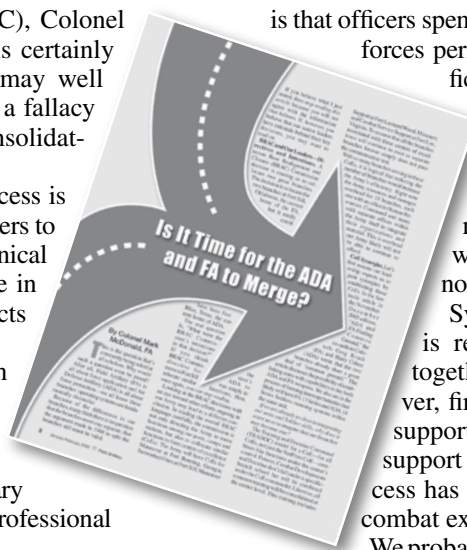
The fallacy in this potential consolidation proposition is that officers do not spend enough time in the operating forces to perfect such skills sets. During the course of a military career, if all an officer did was serve in the operating forces perfecting his warfighting skills, then maybe he could become the multi-faceted officer articulated in the AC’s article. However, reality

is that officers spend far too little time in the operating forces perfecting those skills, making it difficult, if not impossible, to become experts in their trades. To add the skill set of another technical MOS, such as ADA, into the FA “kit bag,” given the realities of the myriad of assignments FA officers will fill during their careers, is simply not feasible.

Synergy within a combat command is realized when true experts come together from various skill sets (maneuver, fires, aviation, Air Defense, service support, etc.) and bring their expertise to support the one fight. This formula for success has passed the test in our most recent combat experiences.

We probably should take a critical look at the rationale for splitting the FA and ADA back in 1968 before we embrace consolidating the branches. I’d bet some of the rationale for the split remains valid today.

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## Response to: “TF 2-2 IN FSE AAR—Indirect Fires in the Battle of Fallujah”

I read the article in the March-April 2005 issue with great interest and, in part, with utter amazement. It appears, from

the article, that the new artillery tactics are to leave behind the ability to mass fires by deploying batteries with task forces and then further diluting that ability by deploying sections. The authors [Captain James T. Cobb, et. al.] also indicated that the tactics included other artillery support available that was not used because they “didn’t trust the accuracy” of the support in danger-close missions. By the end of the article, I

had visions of “flying artillery unlimbering to fire grape shot at the flank of the advancing infantry.”

While it is obvious that artillery tactics and deployment in post-invasion Iraq and a MOUT [military operations in urban terrain] battle like in Fallujah would not require Cold War battalions of artillery, I was concerned in reading the AAR [after-action review] that the ability to mass fires, quickly coordinate those fires and keep up with ammunition planning and resupply has also been diluted. Is this from the dispersion of batteries with the concurrent loss of adequate artillery staff?

The strength of the US Field Artillery has been its ability to coordinate massed artillery fires quickly and accurately. Reading this article, I had the impression that this ability is being lost.

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